

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
23 June 2005 (23.06.2005)

PCT

(10) International Publication Number  
**WO 2005/057711 A2**

(51) International Patent Classification<sup>7</sup>: **H01M 8/12**, 4/88, 4/94, 4/86

(21) International Application Number:  
PCT/JP2004/018095

(22) International Filing Date:  
29 November 2004 (29.11.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
2003-408486 8 December 2003 (08.12.2003) JP

(71) Applicant (for all designated States except US): **TOYOTA JIDOSHA KABUSHIKI KAISHA** [JP/JP]; 1, Toyota-cho, Toyota-shi, Aichi 471-8571 (JP).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **AOYAMA, Satoshi** [JP/JP]; c/o Toyota Jidosha Kabushiki Kaisha, 1, Toyota-cho, Toyota-shi, Aichi 471-8571 (JP). **ITO, Naoki** [JP/JP]; c/o Toyota Jidosha Kabushiki Kaisha, 1, Toyota-cho, Toyota-shi, Aichi 471-8571 (JP). **SATO, Hiromichi** [JP/JP]; c/o Toyota Jidosha Kabushiki Kaisha, 1, Toyota-cho, Toyota-shi, Aichi 471-8571 (JP).

(74) Agent: **TOKKYO GYOMUHOJIN MEISEI INTERNATIONAL PATENT FIRM**; Mitsui-Sumitomo Bank Bldg., 7th Floor, 18-19, Nishiki 2-chome, Naka-ku, Nagoya-shi, Aichi 460-0003 (JP).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

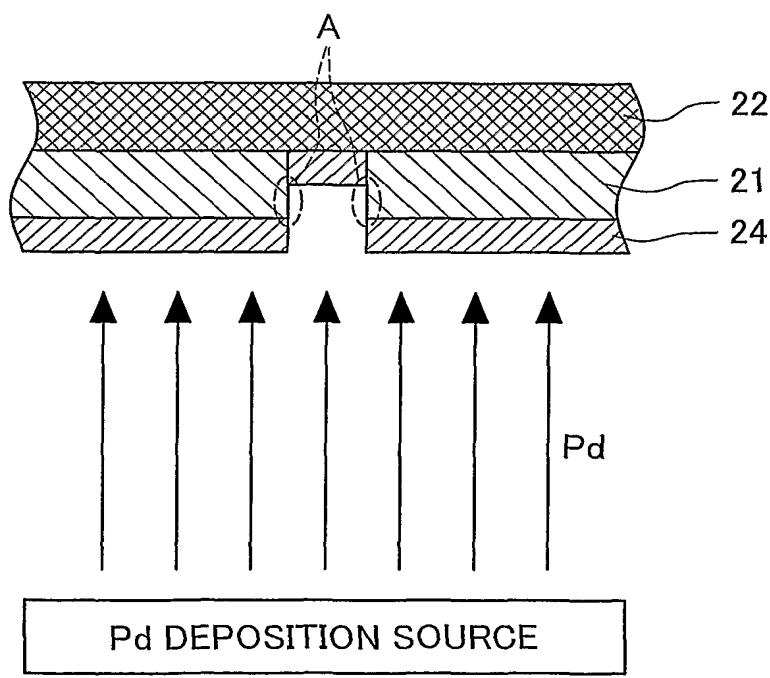
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— without international search report and to be republished upon receipt of that report

[Continued on next page]

(54) Title: FUEL CELL MANUFACTURING METHOD AND FUEL CELL



(57) Abstract: The manufacturing method of the invention is applied to manufacture a unit fuel cell 20, which has a hydrogen-permeable metal layer 22 of a hydrogen-permeable metal and an electrolyte layer 21 that is located on the hydrogen-permeable metal layer 22 and has proton conductivity. The method first forms the electrolyte layer 21 on the hydrogen-permeable metal layer 22, and subsequently forms an electrically conductive cathode 24 on the electrolyte layer 21 to block off an electrical connection between the cathode 24 and the hydrogen-permeable metal layer 22. The method releases Pd toward the electrolyte layer 21 in a direction substantially perpendicular to the electrolyte layer 21 to form a Pd layer as the cathode 24 that is thinner than the electrolyte layer 21. This arrangement of the invention effectively prevents a potential short circuit, for example, between the cathode and the hydrogen-permeable metal layer, in the fuel cell, due to pores present in the electrolyte layer.



*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*